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**China's Energy Picture in 1985: Good
Performance, Uncertain Prospects**

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Summary

China's energy sector turned in a strong performance in 1985, with record production of coal, oil, and electric power. Energy growth of 8 percent, supplemented by improved efficiency and conservation, helped sustain China's double-digit industrial growth last year. Nonetheless, chronic problems with power shortages and coal transport continued to disrupt the economy, and offshore oil exploration showed little promise of providing a new long-run source of supply.

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This memorandum was prepared by Office of East Asian Analysis. Information available as of 28 March 1986 was used in its preparation. Comments and queries are welcome and may be directed to the Chief, China Division, OEA

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China's future energy prospects are further clouded by budget and foreign exchange problems that may reduce funds needed for expansion. Planners are taking a hard look at planned "big ticket" items like the civilian nuclear program and the Three Gorges dam, and have already cancelled a major coal venture with Japan. In the short run, US exports to China of energy technology and equipment may be hurt by these cutbacks, but the United States is likely to remain China's principle foreign investor in the energy sector and a key source of energy technology crucial to its modernization.

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Growth, but Problems

Last year's energy growth of 8 percent (down slightly from 9 percent in 1984) was enough to sustain an 18.4-percent increase in China's gross industrial output (see table 1). Even so, the Chinese claim that one-fifth of their industrial capacity is idled by chronic power outages. Industry is using energy more efficiently, but these advances are more the result of better resource management than of technological improvements. Because these are largely one-time gains, China's ability to maintain double-digit industrial growth with single-digit energy growth remains highly doubtful.

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Table 1. China's Energy Production in 1985

	1985	1984	Growth (%)	Share of China's Energy (%)
Total energy*	840	780	7.8	100.0
Coal (million metric tons)	850	789	7.7	72
Oil (million barrels per day)	2.496	2.286	9.2	21
Natural gas (billion cubic meters)	12.86	12.43	3.5	2
Electric power (billion kilowatt hours)	407.3	377.0	8.0	**
Of which:				
Hydropower (bkwh)	91.0	86.8	4.8	5

* In million tons of coal equivalent, or standard coal; it is equivalent to 1.4 tons of coal, .014 b/d of oil, 752 cubic meters of natural gas, or 2,421 kwh of electricity.

**Electric power's share of China's energy is included under primary sources--coal, oil, and hydropower.

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Last year's runaway industrial growth--which taxed domestic resources and contributed to a drain in China's foreign exchange holdings--threatens Beijing's ability to expand energy supplies. Indeed, despite the high priority the Chinese have given the energy sector over the past few years, proposed energy investments face stiff competition from other rapidly growing sectors of the economy for scarce state funding, foreign exchange, and building materials.¹ With less money likely to be available, China will be forced to weigh carefully decisions on expensive, long-term projects such as nuclear plants and the massive Three Gorges hydroproject against the construction of cheaper, coal-fired power plants that are faster to build. China may also have to cut imports of Western technology that are critical to its efforts to expand oil and coal production. Transport improvements--essential to moving energy to consumers--could also be hit by the budget and foreign exchange crunch. The net effect of lower

¹ The funding shortage will be exacerbated by the drop in world oil prices, which could cost Beijing \$1.6 billion in earnings in 1986.

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investments in energy and related transport projects over the longer run would be to impose further constraints on economic growth; similar cuts in 1981 dampened later energy output and economic growth and are still being felt. [REDACTED]

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The United States--which to date is China's largest foreign investor in the energy sector and a key supplier of energy-related technology--is likely, in turn, to be affected by any cutbacks.² In fact, the United States already appears to be out of the running in supplying China with nuclear power plants, despite passage of the nuclear cooperation agreement. We still expect US firms to account for a major share of China's energy-related imports for some time. Just as China presses Japan to meet US levels of direct foreign investment, however, it will continue to prod the United States to match Japan's lower-cost project and equipment financing. [REDACTED]

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Coal: Reforms Bolster Growth

We believe that reforms in mine ownership, wages, and prices have been the primary reasons for the strong growth in China's coal output. Beijing's decision in 1983 to allow individuals and collectives to mine coal did much to encourage peasants, eager to profit from small-scale industries, to increase production. Last year, 62,500 such small mines produced about one-fourth of China's coal; another quarter came from medium-sized mines owned by provinces or localities, and China's large state-owned mines produced the remaining half. According to preliminary figures issued by Beijing, production last year at small- and medium-scale mines grew two and a half times faster than at the state mines, largely because of the opening of 12,500 new small mines. [REDACTED]

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At all levels, the use of piece wages and special bonuses continued to improve productivity. Beijing has also raised the average price of coal to encourage production. While the official price of coal remains low, prices are negotiable for above-quota production from large-scale state mines and for all coal from smaller mines. [REDACTED]

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² The United States is the largest foreign investor in China's energy sector. China's two biggest joint ventures--the Pingshuo open-pit coal mine and the offshore natural gas field near Hainan -- both involve US firms. The United States also has provided key energy technologies that helped China to find more oil and accelerate oil production, to upgrade hydro and thermal power plant construction and operation, and to develop safety procedures for new nuclear plants. [REDACTED]

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[REDACTED]

Last June, China signed a \$650 million joint venture with the US firm Occidental Petroleum to jointly develop the world's largest open-pit coal mine--Pingshuo--located in Shanxi Province. The project, which will produce 15 million tons a year beginning in 1988, would have been signed several years ago, but the declining international price of coal made financing difficult. Falling prices also recently contributed to Royal Dutch Shell's cancellation of an open-pit mine project in Shandong Province, and to Japan's indefinite postponement of another large open-pit mine planned for Inner Mongolia. If international prices stay low, China may find it difficult to market its coal abroad, and could be forced to dip into its foreign exchange reserves to pay off foreign investors.

[REDACTED]

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Oil--Offshore Exploration

Foreign oil companies exploring China's offshore basins began trial production of oil from offshore wells in 1985, with commercial production and export scheduled for later this year. Even so, offshore efforts continue to be a major disappointment for China's long-run energy planning. The Chinese originally hoped to find a 1 to 2 million-barrels per day (b/d) supply offshore, both to meet growing consumption and export needs and to offset expected eventual declines at mature onshore fields. Production this year will reach only 20,000 b/d, from sites developed by the Japanese in the Bohai and by the French in the Beibu Gulf. In the absence of a now-unlikely major find, we believe China will be lucky to eventually produce one-tenth the amount it anticipated offshore.

[REDACTED]

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The big financial losers in the offshore effort, of course, are the foreign oil companies who bore all survey and exploration costs, spending almost \$2 billion. Three US firms found oil, but all will carry out more drilling before committing themselves to commercial production. Most firms fared much more poorly; China had to give some unsuccessful participants additional acreage to keep them from quitting.

[REDACTED]

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China in 1985 offered for bid a second set of exploration blocks, before foreign interest had waned any further. Of the 19 blocks available, contracts have been signed for six of the more promising areas. Declining world oil prices and continued poor showings from first round drilling are, however, likely to dampen Western enthusiasm and leave most of the remaining blocks unsigned.

[REDACTED]

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Onshore Oil

China's 9-percent increase in crude oil production during the past year came as a result of new finds, improved recovery techniques, and greater productivity at existing onshore fields. The Shengli oilfield, located in Shandong Province, has made particularly impressive production gains and provided almost 40 percent of last year's total growth. The Chinese predict that Shengli's major new finds will double the field's production by 1990 to 1 million b/d. Over 50 Western technicians are working at Shengli to find and develop new wells.

[REDACTED]

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Recent discoveries on the periphery of several existing fields led Beijing to predict that China's oil output will grow by 5 percent per annum through the current Seventh Five-Year Plan, reaching 3 million b/d in 1990. We believe China can reach this goal, but sustaining it will require additional new finds to replace declining production at older fields. [REDACTED]

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China's ambitious oil production goals hinge on maintaining output at China's largest field, Daqing, a mature field in Heilongjiang Province. Almost half of China's current oil supply is produced at Daqing. We believe production at Daqing could start declining in the next few years, despite recent Chinese claims that they can sustain Daqing's current production for another 10 years. [REDACTED]

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In March 1985, China opened 1.83 million square kilometers in 10 southern provinces to oil exploration by foreign firms, in the wake of the offshore program's disappointing results. The areas Beijing opened have few existing fields and are largely unexplored. An Australian consortium signed the first--and to date only--onshore oil exploration contract in May 1985 for an area on Hainan Island. In July China opened its first onshore basin to international bids--the Subei Basin in Jiangsu Province. Meanwhile, Beijing continues to contract with foreign firms, including ones from the United States, to provide seismic survey crews and equipment to search for oil in China's northwest. [REDACTED]

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Almost all of China's increased oil production last year was exported as either crude oil or petroleum products. We estimate that China exported 580,000 b/d of crude oil and 120,000 b/d of petroleum products in 1985, worth \$6.4 billion, almost 25 percent of China's exports. Beijing has nearly doubled the volume of its crude oil exports in the last two years by undercutting OPEC prices, marketing aggressively, and conserving domestic supplies. But in February, China announced that it will freeze the volume of its oil exports at the 1985 level to help support the falling international price of oil. If China sustains a freeze and crude oil prices average \$18 per barrel, we believe China's foreign exchange earnings from oil could decline by \$1.6 billion this year. [REDACTED]

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Electric Power: Shortages Force Equipment Imports

Faster power growth in 1985 stemmed from improved coal shipments to power plants, good rainfall in hydropower areas, and accelerated power plant completions. Nevertheless, chronic shortages remained serious as the economic policies encouraging industrial growth collided with inadequate power capacity--fallout from ill-conceived investment cutbacks in the early 1980s that slowed power plant construction through 1984. [REDACTED]

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China added 6,100 megawatts of new capacity in 1985, the most in one year since the late 1970s and the direct result of power budget increases of 25 percent in 1983 and 35 percent in 1984. About 90 percent of the new plant capacity came from thermal plants in the power-starved east and northeast, many brought to completion ahead of schedule. [REDACTED]

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[redacted]

Hydroplant construction problems--only one major generator became operational in 1985--have forced Beijing to emphasize construction of coal-fired plants that are cheaper and faster to build, even though they are more expensive to operate. China's ability to supply power generation equipment is still not up to the task, however. China's three major power equipment factories have all imported US technology but are still unable to meet demand. Meanwhile, China has said it will import 10,000 MW of thermal generators over the next five years, over half of its planned capacity additions. Reportedly, China will buy up to 6,000 MW of these imports from the USSR and Eastern Europe as part of its efforts to expand trade with the Soviet Bloc. [redacted]

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Beijing already recognizes that even these additions will not solve the power crises in its eastern cities. In 1985, China established the Huaneng Energy Corporation to negotiate imports of complete power plants outside of the state plan. On 26 February, a consortium led by the US firm General Electric signed contracts in Beijing to provide Huaneng's first two whole-plant imports for Nantong in Jiangsu Province, and for Shijiazhuang, the capital of Hebei. The Chinese are unlikely to award all Huaneng contracts to a single source--and Tokyo is considering new low-cost financing [redacted] [redacted]--but prospects for additional US sales are excellent. [redacted]

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China's Nuclear Power Program

Progress has been slow in China's efforts to begin commercial nuclear power production. In March, China signed letters of intent with France to supply reactors for its planned 1,800-megawatt nuclear plant at Daya Bay in Guangdong Province, but final contracts have not yet been signed. Work continues on a small (300 MW), domestically built reactor at Qinshan that relies substantially on components and technology imported from Japan and West Germany. Meanwhile, China has postponed or cancelled plans for additional nuclear plants at Sunan (Jiangsu Province), and in Liaoning and Fujian; China will probably scale back its plans to have 10,000 MW of nuclear power operational by the year 2000. [redacted]

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New Priorities for Natural Gas

Natural gas production had its best year since 1980; the discovery of a massive offshore natural gas reserve by the US firm Arco bolstered China's interest in gas as a source of energy. The Chinese in 1985 signed a \$500 million agreement with Arco--China's second-largest joint venture after Pingshuo--to develop the field off Hainan Island and bring the gas ashore. China expects the project to yield 3.25 billion cubic meters of gas per year--equal to one-fourth their current output--for about 20 years, beginning in 1992. Beijing also plans to accelerate growth of onshore gas exploration and production while awaiting development of the Arco find. China announced recently that it will double production by 1990 at gasfields in Sichuan Province, the source of half of China's natural gas. [redacted]

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China has also stepped up efforts to collect oil-associated gas at oilfields like Huabei and Liaohe and is adding to pipelines that transport the gas to eastern cities. China hopes to expand its use of natural gas at smaller power plants and in urban households for heating and cooking, to reduce coal consumption and urban pollution.



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